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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/919,584	07/30/2001	Peter W.J. Jones	TBRX-P01-001	2595

28120 7590 09/08/2005

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EXAMINER
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WANG, JIN CHENG

ART UNIT	PAPER NUMBER
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2672

DATE MAILED: 09/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.



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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 09/919,584  
Filing Date: July 30, 2001  
Appellant(s): JONES ET AL.

**MAILED**

**SEP 08 2005**

**Technology Center 2600**

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Agnes S. Lee  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed 3/21/2005.

**(1) Real Party in Interest**

A statement identifying the real party in interest is contained in the brief.

**(2) *Related Appeals and Interferences***

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

**(3) *Status of Claims***

The statement of the status of the claims contained in the brief is correct.

**(4) *Status of Amendments After Final***

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) *Summary of Invention***

The summary of invention contained in the brief is correct.

**(6) *Issues***

The appellant's statement of the issues in the brief is correct.

**(7) *Grouping of Claims***

Appellant's brief includes a statement that claims 1-24 do not stand or fall together and provides reasons as set forth in 37 CFR 1.192(c)(7) and (c)(8).

**(8) *Claims Appealed***

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(9) *Prior Art of Record***

5,682,180	Young	10-1997
6,018,237	Havel	01-2000

**(10) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Young et al. (US patent no. 5,682,180) in view of Havel (US patent no. 6,018,237).

Re claim 1, Young teaches a method that gives the perception of a display with a full range of color from a matrix of optical elements of a first or a second color (col. 1, lines 8-37), comprising providing a two-color display of optical elements of a first color and a second color and being arranged in an alternating pattern (col. 5, line 57 to col. 6, line 44), and translating the relative brightness of the points created by the full color display into a corresponding brightness for the respective points on the two-color display (col. 8, lines 12-58).

In other words, Young discloses electronic color displays, including CRTs and flat-panel color displays particularly displays based on the opponent color vector phenomenon, including **two-element** scanned and matrix-addressable color displays. He teaches a pattern other than checkerboard could be used for the polarizing elements of the combined neutral density/dichroic pair. For instance, alternating neutral density and dichroic stripes, either vertical or horizontal, could be used. Consequently, with the appropriate groupings of patterns and rotations, either white/black or orange/cyan colors can be produced. This is true for any pair of color combinations, where the pair is chosen in accord with the opponent color scheme. Moreover, Young teaches an electronic display generates an image which, through substantial registry of two opponent vector **images**, is perceived as a full color image. The display receives two channels of information representing two opponent color vectors of an image to be displayed,

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develops two images in the two opponent color vectors, and superimposes the two images to generate the image which is perceived as a full color image. Moreover, the two-color image can be displayed on a two-color display.

Young fails to *specifically* disclose determining for an image presented on a full color display, the relative brightness for points of the image produced by the full color display as claimed. However, Young discloses determining the brightness of the hues orange and cyan. See for example, column 6, lines 14-33 wherein Young discloses the total luminance (brightness) of each orange and cyan phosphor pair and the total luminance for all the orange/cyan phosphor pairs may be **lowered or raised**, and thus *transformed/translated*. Moreover, Young discloses varying the relative brightness of the orange and cyan hues. In column 6, lines 53-65, Young further discloses varying the luminance of the orange and cyan hues by exciting the orange phosphors at the first voltage (first luminous intensities) and by exciting the cyan phosphors at the higher voltage (second luminous intensities). Finally, Young discloses in column 10, lines 15-20 **using filter 189 to control the luminance** (brightness) of the images using two matrix addressable cells.

Thus, Young discloses that the relative brightness of each pixel created by the three-color display is translated into a corresponding total brightness (luminance) for the respective pixels on the two-color display or *the two-color images by using the filters or by lowering or raising the voltages applied to the orange and cyan phosphors*. By varying the luminance of the orange and cyan hues, Young also discloses a process for translating the relative brightness of the three-color components to relative brightness levels of the orange and cyan hues by respectively exciting the cyan and orange phosphors with different voltages that are controlled.

However, Havel discloses determining for an image presented on a full color display, the relative brightness for points of the image produced by the full color display (col. 1, line 65 to col. 3, line 11) wherein the relative brightness is determined by the logic level in the color control circuit and the applied voltage level (See Figs. 7, 11 and column 7-9). Havel teaches 2-LED variable color display with a variable 2-primary color converter for converting an input voltage to variable color (Figs. 27 and 29) which is capable of illuminating the display in any color of the spectrum, in accordance with the magnitude of the input voltage. Havel teaches translating three color inputs to two color outputs (Figs. 7, 11, 13, 17, 18). Havel's color control logic (Fig. 5) accepts color control logic signals at its inputs red, green and yellow and develops at its outputs drive signals for red bus and green bus to illuminate a two-color display. Thus, Havel discloses translating (e.g., through color control) the relative brightness of the points of the three-color image into a corresponding brightness for the respective points of the two-color image on the two-color display or a variable color digital display capable of displaying only two-color image (Figs. 5, 27, 29 and 59). Moreover, Havel explicitly teaches a two-color display or a variable color display capable of displaying only two-color image (See Figs. 7, 11, 13, 17, 18). The red and green emitters are inherently arranged in an alternating pattern. Thus, Havel teaches other claim limitations set forth in the claim 1 as well.

Thus, it would have been obvious for one of ordinary skill in the art to combine determining for an image presented on a full color display, the relative brightness for points of the image produced by the full color display of Havel to the system of Young because it would have enabled illuminating the display in a selected one of several possible colors (Havel column 2, lines 1-19 and column 7-9). It would also have been obvious for one of ordinary skill in the art

to have used Havel's two-color display for displaying the two-color images of Young such as the orange and cyan image of Young on the two-color display of Havel because such construction provides a different display device, other than the three-color display device, for exclusively displaying the two-color image (See the 2-LED variable color display device of Havel Figs. 8, 11, 13, 17 and 18).

Re claims 2, 6-7, and 14, Young teaches translating includes mapping a three dimensional coordinate representative of the relative brightness of a point to a two dimensional point (col. 8, lines 12-58). Young teaches the dimension of the coordinates consisting of XYZ which are in three dimensional and can be in two dimensional too.

Re claims 3-5 and 15, Young teaches a flashing period representative of a timing pattern for flashing the two-color display (figs. 1a-1b).

Re claims 8 and 16-19, Young teaches a noise signal and summing the noise signal with the relative brightness for the two-color of the first and/or the second color emitter (col. 3, lines 12d9). Young discloses green/magenta vector accounts for only 6% of the color. It is negative in the middle of the spectrum and positive at the extremes (the remaining 7% of the color variance is attributable to noise in the neural data).

Re claim 9, Young teaches a video driver for driving a video display as a function of the translated relative brightness of points for a two-color display (col. 4, line 56 to col. 5, line 12). In other words, Young teaches the electronic data of a conventional video camera can readily be converted into the opponent color vectors. Conventional video cameras typically record three separate images of a scene, a red image, a green image, and a blue image, which represent traditional color theory images of the scene.

Re claims 10-11 and 17, Young teaches optical elements comprise light emitting diodes and filters (col. 7, lines 26-52). In other words, Young discloses a projection display using two flat-panel matrix-addressable filters.

Re claims 20-23, Young teaches a border having a color that is the combination of the first and the second colors or the two color display and being arranged substantially around the periphery of the display (figs. 1-2 and 5).

Re Claim 24, Havel teaches led, lcd, crt, and light emitting polymer display (figs. 28 and 30).

Re claims 12-13, the limitations of claims 12-13 are identical to claim 1 above. Therefore, claims 12-13 are treated the same as discussed with respect to claim 1 above.

**(11) Response to Argument**

On Page 4, appellant argues in essence with respect to the Claim 1 and similar claims that:

(A) “The Examiner has asserted that it would have been obvious under Young, in view of Havel, to provide a two-color display of optical elements of a first color or a second color to give the perception of a display with a full range of color...Applicants’ invention provides the perception of a display with a full range of color from a matrix of optical elements of a first or a second color...”

In response to the arguments in (A), appellant argues providing a two-color display of optical elements of a first color or a second color to give the perception of a display with a *full* range of color. Appellant’s two-color display of only two optical elements of red and green

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colors for achieving a *full* range of colors cannot be ascertained for the reasons below. From appellant's specification, the two colors are any two colors of the three-color elements RGB, e.g., the color red and the color green. However, the red and green hues only account for approximately 43.5% of the perceived colors (see Young column 3, lines 35-40) and yellow and blue hues account for another 43.5% of the perceived colors. According to the appellant's claim invention, appellant could provide only two color elements such as the red and green, to give *full* range of colors. The red and green hues generated by the red and green emitters alone can *by no means* provide *full* range of the perceived colors with approximately 100% of the perceived colors. Appellant provides two-color display which is already known in the prior art. The optical elements such as the red and green emitters can give the perception of a display with only a limited range of perceived colors.

On Page 4, appellant argues in essence with respect to the Claim 1 and similar claims that:

(B) "Instead, Young teaches the use of two opponent color vectors to account for the majority of all perceived colors and gives illustrative examples using an orange/cyan and black/white opponent color vectors. (Col. 3, lines 39-49). The use of the orange/cyan and black/white opponent color vectors as depicted in Figures 2 and 4 demonstrates that Young uses four colors, i.e., orange, cyan, black, and white, to simulate a full color image..."

In response to the arguments in (B), only the yellow and cyan are considered as the first color and the second color. The black and white elements are neutral colors as the human

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perceives them as neutral. Young provides only two non-neutral colors, yellow and cyan, to simulate a two-color image which is later combined with another two-color image to produce a full color image. Young also teaches providing a two-color image such as the yellow and cyan color image. The yellow and cyan color image is exclusively made of two colors, i.e., yellow and cyan. Young thereby implicitly teaches the two-color display of the two-color image because the two-color image is capable of being displayed on a two-color display.

Finally, it is noted that the optical elements of the yellow and cyan are alternately arranged on a full-color display when the combined full color image is displayed on a full color display. The optical elements of the yellow and cyan are alternately arranged on a two-color display when the two-color image is displayed on a two-color display.

On Page 5, appellant argues in essence with respect to the Claim 1 and similar claims that:

(C) “Basically, Young teaches creating the hues orange, cyan, and a combination of the two from polarized light. However, Young is silent regarding the brightness of these hues. Young fails to teach or suggest varying, modifying, or using the brightness of the orange and cyan hues...”

In response to the arguments in (C), throughout Young’s specification, Young discloses brightness of the hues orange and cyan. See for example, column 6, lines 14-33 wherein Young discloses the total **luminance** (brightness) of each orange and cyan phosphor pair and the total **luminance** (brightness) for all the orange/cyan phosphor pairs may be **lowered or raised**. Moreover, Young discloses varying the relative brightness of the orange and cyan hues. In

column 6, lines 53-65, Young further discloses respectively varying the luminance of the orange and cyan hues by exciting the orange phosphors at the first voltage (first luminous intensities) and by exciting the cyan phosphors at the higher voltage (second luminous intensities). Finally, Young discloses in column 10, lines 15-20 using filter 189 to control the luminance (brightness) of the images using two matrix addressable cells.

Young discloses changing the polarization of light and the proportion of each color depending upon the angle of polarization. The relative brightness can be controlled by changing the polarization of light and/or the filters applied to each pixel. The total luminance level may be raised or lowered to the level of the total brightness of the pixels presented on a full color display. Meanwhile, such luminance level may be raised or lowered to the level of the total brightness of the pixels presented on a two-color display based on the two-color orange and cyan image. Thus Young implicitly teaches *electronically controlling* and translating the relative brightness of the points/pixels presented on a full color display and the relative brightness of the points/pixels presented on a full color display INTO the corresponding brightness for the respective points/pixels on the two-color or two-channel display.

On Page 5, appellant argues in essence with respect to the Claim 1 and similar claims that:

(D) "Havel fails to teach a device or method that translates the relative brightness of the points created by a full color display into a corresponding brightness of the respective points on a two color display. Havel merely teaches measuring an input parameter and generating in response thereto, a two or three color variable display. Havel lacks any

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description of any system or method that translates a measure of relative brightness into anything.....”

In response to the arguments in (D), Young discloses brightness of the hues orange and cyan. See for example, column 6, lines 14-33 wherein Young discloses the total luminance (brightness) of each orange and cyan phosphor pair and the total luminance for all the orange/cyan phosphor pairs may be **lowered or raised**, and thus transformed/translated. Moreover, Young discloses varying the relative brightness of the orange and cyan hues. In column 6, lines 53-65, Young further discloses varying the luminance of the orange and cyan hues by exciting the orange phosphors at the first voltage (first luminous intensities) and by exciting the cyan phosphors at the higher voltage (second luminous intensities). Finally, Young discloses in column 10, lines 15-20 **using filter 189 to control the luminance** (brightness) of the images using two matrix addressable cells. Thus, Young discloses that the relative brightness of each pixel created by the three-color display is translated into a corresponding total brightness (luminance) for the respective pixels on the two-color display or the two-color images by using the filters or by lowering or raising the voltages applied to the orange and cyan phosphors. By varying the luminance of the orange and cyan hues, Young also discloses a process for translating the relative brightness of the three-color components to relative brightness levels of the orange and cyan hues by respectively exciting the cyan and orange phosphors with different voltages that are controlled.

Havel discloses determining for an image presented on a full color display, the relative brightness for points of the image produced by the full color display (col. 1, line 65 to col. 3, line 11) wherein the relative brightness is determined by the logic level in the color control circuit

and the applied voltage level (See Figs. 7, 11 and column 7-9). Havel teaches **2-LED variable color display with a variable 2-primary color converter** for converting an input voltage to variable color (Figs. 27 and 29) which is capable of illuminating the display in any color of the spectrum, in accordance with the magnitude of the input voltage. Havel teaches translating three color inputs to two color outputs (Figs. 7, 11, 13, 17, 18). Havel's color control logic (Fig. 5) accepts color control logic signals at its inputs red, green and yellow and develops at its outputs drive signals for red bus and green bus to illuminate a two-color display. Thus, Havel discloses translating (e.g., through color control) the relative brightness of the points of the three-color image into a corresponding brightness for the respective points of the two-color image on the two-color display or a variable color digital display capable of displaying only two-color image (Figs. 5, 27, 29 and 59). Moreover, Havel explicitly teaches a two-color display or a variable color display capable of displaying only two-color image (See Figs. 7, 11, 13, 17, 18). The red and green emitters are inherently arranged in an alternating pattern. Thus, Havel teaches other claim limitations set forth in the claim 1 as well.

Thus, it would have been obvious for one of ordinary skill in the art to combine determining for an image presented on a full color display, the relative brightness for points of the image produced by the full color display of Havel to the system of Young because it would have enabled illuminating the display in a selected one of several possible colors (Havel column 2, lines 1-19 and column 7-9). It would also have been obvious for one of ordinary skill in the art to have used Havel's two-color display for displaying the two-color images of Young such as the orange and cyan image of Young on the two-color display of Havel because such construction provides a different display device, other than the three-color display device, for exclusively

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displaying the two-color image, not the other two-color images (See the 2-LED variable color display device of Havel Figs. 8, 11, 13, 17 and 18).

On Page 6, appellant argues in essence with respect to the Claim 4, 5, 6, 7 and similar claims that:

(E) “Young and Havel as both references are silent as to and fail to teach: 1) flashing the two-color display includes alternating the display at the flashing period between the image presented in the first and the second color as required by claim 4, 2) varying the flashing period as required by claim 5...”

In response to the arguments in (E), Young teaches in column 1 and Figs. 1a and 1b the varying *wavelength frequencies* associated with the color components such as the cyan and orange by using the filters. Changing the *wavelength frequencies* also changes the flashing period between the image presented in the first and the second color.

Moreover, the neutral density polarizer is capable of producing linearly polarized light at all visible wavelengths and the system is allowed to switch between a light transmitting and a light blocking state and when either of the two neutral polarizers 100 and 106 is replaced by a single color dichroic polarizer, the system now switches light between a white light state and a colored light state or when one of the two neutral polarizers is replaced by a pair of different colored dichroic polarizers, the system is further allowed to switch between the two colors cyan and orange, thus changing the flashing periods of the optical elements.

On Page 6, appellant argues in essence with respect to the Claim 1 and similar claims that:

(F) “None of the cited references teaches or suggests that the Havel display system is applicable to providing a two-color display of optical elements of a first color or a second color to give the perception of a display with a full range color...”

In response to the arguments in (F), appellant’s two-color display of only two optical elements of red and green colors for achieving a full range of colors cannot be ascertained for the reasons below. Appellant’s specification has recited the first color and the second color being the red and green. However, the red and green hues only account for approximately 43.5% of the perceived colors (see Young column 3, lines 35-40) and yellow and blue hues account for another 43.5% of the perceived colors. According appellant’s claim invention, appellant could provide only two color elements such as the red and green, to give *full* range of colors. The red and green hues generated by the red and green emitters alone can *only* provide a *limited* range of the perceived colors, i.e., much less than 100% of the perceived colors. Appellant provides two-color display which is already known in the prior art. In conclusion, Appellant’s claim invention has not provided any improvement over the prior art of the full color display of Young with a full range of the perceived colors or a two-color display of Havel or a variable-color display of Havel.

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Respectfully submitted,

jcw

August 29, 2005

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